

STANDARDS DEVELOPMENT BRANCH OMOE



36936000007996



W.Q. LIB
KAMHISTIKWIA R. (21)

PA-2
Port Arthur

THE
ONTARIO WATER RESOURCES
COMMISSION

WATER POLLUTION SURVEY

of the

CITY OF PORT ARTHUR

DISTRICT OF THUNDER BAY

1964

CITY OF PORT ARTHUR 1964

DISTRICT OF THUNDER BAY

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca

R E P O R T

on a

WATER POLLUTION SURVEY

of the

CITY OF PORT ARTHUR

District of Thunder Bay

September 21 and 22, 1964

Division of Sanitary Engineering

REPORT

ONTARIO WATER RESOURCES COMMISSION

A water pollution survey of surface-water drains, storm sewers, and watercourses within the City of Port Arthur was conducted on September 21, 1964. Sanitary sewers, which discharge untreated sewage directly into receiving waters, were also included in the survey.

Mr. T. Fell, P. Eng., City Engineer, provided information pertinent to the survey, and also made assistance available for the sampling programme.

GENERAL

The City of Port Arthur, with assessed population of 45,098, (1964 Municipal Directory) is located on the west shore of Thunder Bay, which is a section of Lake Superior.

The elevation of the city ranges from the lake level elevation of 603 feet to 900 feet in the northern section.

General drainage from the area is into Thunder Bay. However, local drainage for much of the municipality is provided by the Current River in the northern section, McVicars Creek in the central areas, and the McIntyre River in the southern sections of the city.

A primary sewage treatment plant with a system of trunk and collector sewers is currently in operation. The present sewerage programme is based primarily on the collection and treatment of domestic wastes. Individual treatment is necessary for wastes from

industries such as The Provincial Paper Company Limited, The Abitibi Power and Paper Company Limited, and the Northern Wood Preservers Limited. Waste flows from some smaller industries are accepted for treatment in the municipal plant depending on the strength and volume of such wastes.

The sewerage programme has not yet been developed to include the servicing of the entire city, consequently inadequately treated flows continue to be discharged through some sewer outfalls.

WATER QUALITY ANALYSES

Water samples were collected, where possible, from the flow of all known drain and sewer outfalls, and from the receiving watercourses throughout the municipality.

The sanitary chemical and bacteriological analyses of such samples are shown on tables 1 and 2 respectively.

The locations of sampling points are indicated on the accompanying plan of Port Arthur.

INTERPRETATION OF LABORATORY ANALYSES

For convenience in the interpretation of laboratory analyses, the Ontario Water Resources Commission objectives for water quality pertaining to surface-water drains, storm sewers, and watercourses are listed:

Surface-Water Drains and Storm Sewers

5-Day BOD (Biochemical Oxygen Demand) - not greater than
15 parts per million (ppm)

Suspended Solids - not greater than 15 parts per million (ppm).

Coliform Count - Most Probable Number (M.P.N.) - not greater than 2,400 per 100 cubic centimeters (c.c.)

Anionic Detergent

The presence of anionic detergent in water samples indicates pollution from domestic sources.

Watercourses and Bodies of Water

5-Day BOD (Biochemical Oxygen Demand) - not greater than 4 parts per million (ppm).

Coliform Count - Most Probable Number (M.P.N.) - not greater than 2,400 per 100 cubic centimeters (c.c.).

SIGNIFICANCE OF LABORATORY ANALYSES

A total of 39 drains, with 16 outfalls to Thunder Bay, three to the Current River, 18 to McVicars Creek and two to the McIntyre River, were investigated. Of this total, 17 contained no flow at the time of inspection, while the remaining 22 had varying rates of flow, from a trickle to an estimated flow of 25 to 30 gallons per minute.

It is noted that the sanitary chemical analyses and bacteriological examinations of samples collected from the following outfalls are excessively high.

Lillian St. outfall - Sample No. 2.S

Clarke St. outfall - Sample No. 6.S

Front St. outfall - Sample No. 7.S

Park St. outfall - Sample No. 11.S

Wilson St. outfall - Sample No. 13.S.

The indications of pollution were anticipated as these drains are designated as sanitary sewers and are employed for the collection and discharging of inadequately treated domestic sewage and industrial wastes into Thunder Bay.

With the exception of the Bay St. outfall (Sample No. 14.D) the level of pollution in all other surface-water drains and storm sewers examined was comparatively low. The increased total coliform counts and the presence of anionic detergent do indicate however, that in some instances, domestic wastes are being discharged to the drains.

The laboratory analyses of samples collected from the watercourses within the municipality indicate that, at the time of inspection, the level of pollution in the watercourses was relatively low and that the water quality was conforming to OWRC objectives. One exception to this general condition is noted, however, in the analyses of Sample No. M-1 from the McIntyre River. This sample was collected downstream from the Port Arthur sewage treatment plant, and indicates that an increase in the level of pollution is possibly being caused by the effluent from the plant.

SUMMARY

A water pollution survey of surface-water drains, sewers, and watercourses within the City of Port Arthur was conducted on September 21, and 22, 1964.

The discharge of untreated and inadequately treated domestic

and industrial sewage and wastes, continues to be a major source of pollution in the Port Arthur area of Thunder Bay.

The discharge of inadequately treated sanitary sewage from sewers outfalling at or near the harbour end of Lillian Street, Clarke Street, Front Street, Park Street, Wilson Street, and Bay Street is considered as a major contribution to the pollution. It is understood that future phases of the sewerage works programme, currently being instituted, provide for the interception and treatment of sewage from the above named sewers and sewer areas.

The level of pollution in the surface-water drains and storm sewers throughout the municipality is relatively low. The increased coliform counts and the presence of anionic detergents in some drains indicate that some domestic waste is being discharged into them.

The water quality of the sections of the Current River and McVicars Creek, within the municipality, at the time of inspection, was satisfactory. Water quality in the McIntyre River was also satisfactory to a point downstream from the effluent outfall from the water pollution control plant. An increase in pollution was indicated by the laboratory analyses of samples collected at this point.

RECOMMENDATIONS

In consideration of the observations and findings of this water pollution survey the following recommendations are presented:

1. The City of Port Arthur should continue its pollution

abatement programme by providing the necessary means to prevent the discharge of both untreated and inadequately treated sewage and other wastes into any body of water or watercourse.

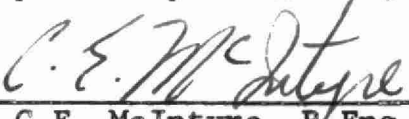
Specific and immediate measures should be taken to intercept and provide treatment for the sewage and wastes currently being carried in the municipal sewer systems designated as the Lillian Street, Clarke Street, Front Street, Park Street, and Wilson Street sanitary sewers.

2. Private drains within the city, through which inadequately treated wastes are being discharged into any watercourse, body of water, or surface-water drain, should be located and severed.

3. As a means of maintaining satisfactory water quality in the McIntyre River, consideration should be given to providing secondary treatment facilities at the municipal water pollution control plant.

All of which is respectfully submitted,

District Engineer


C.E. McIntyre, P.Eng.,

Approved By


K.H. Sharpe, Director.

elb

Prepared By: J.K. Ferris,
Engineer's Assistant.

TABLE I

CITY OF PORT ARTHUR - WATER POLLUTION SURVEYSurface-Water Drains and Sewers

<u>Sample Number</u>	<u>Description of Sampling Points</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>SOLIDS Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>Anionic Detergents as ABS (ppm)</u>	<u>Coliform Count per 100 c.c. M.P.N.</u>
<u>OUTFALLS TO THUNDER BAY</u>							
1.W	Arundel St.	No Flow					
2.S	Lillian St.	185.0	430	92	338	14.6	11,000,000+
3.W	Marion St.	0.1	306	30	276	0.2	1,200
4.W	MacDougall St.	9.0	11,606	11,258	348	0.1	21,000
5.W	Clarke St.	2.6	446	1	445	2.0	930,000
6.S	Clarke St.	175.0	411	92	319	6.2	11,000,000+
7.S	Front St.	200.0	412	52	360	8.0	11,000,000+
8.W	Victoria St.	6.0	466	1	465	0.3	230,000
9.W	Cameron St.	1.4	488	18	470	0.1	230,000
10.S	Arthur St.	Submerged					
11.S	Park St.	92.0	444	80	364	0.6	4,600,000
12.W	Pearl St.	No Flow					

TABLE I CONT'D

<u>Sample Number</u>	<u>Description of Sampling Points</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>SOLIDS Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>Anionic Detergents as ABS (ppm)</u>	<u>Coliform Count per 100 c.c. M.P.N.</u>
13.S	Wilson St.	48.0	724	62	662	2.2	2,400,000
14.D	Bay St.	36.0	402	33	369	0.2	11,000,000+
15.W	John St.	7.6	654	118	536	0.2	210,000
16.D	Fourth Ave.	2.6	578	10	568	0.1	39,000
<u>OUTFALLS TO CURRENT RIVER</u>							
17.W	Arundel St.N., at Black Bay Rd.	No Flow					
18.W	Dewe St.	No Flow					
19.W	Line Dr.,	0.7	362	36	326	0.1	100
<u>OUTFALLS TO McVICARS CREEK</u>							
20.W	Ibbetson St.	No Flow					
21.W	Madeline St.	0.7	522	1	521	0.1	230
22.W	Bruce St.	0.8	346	2	344	0.1	2,300
23.W	Pringle St.	No Flow					
24.W	Dawn St.	1.2	260	12	248	0.1	430

TABLE I CONT'D

<u>Sample Number</u>	<u>Description of Sampling Points</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>SOLIDS Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>Anionic Detergents as ABS (ppm)</u>	<u>Coliform Count per 100 c.c. M.P.N.</u>
25.W	Margaret St.	2.8	404	4	400	0.2	930,000
26.W	Cottonwood Dr.	No Flow					
27.W	Bentwood Dr.	No Flow					
28.W	Autumnwood Dr.	No Flow					
29.W	Sunset Bay	No Flow					
30.W	Farrand St.	No Flow					
31.W	River St.	No Flow					
32.W	Jean St.	0.4	148	2	146	0.2	430
33.W	Algoma St., north side	No Flow					
34.W	Algoma St., south side	No Flow					
35.W	Court St.	No Flow					
36.W	Cumberland St.	No Flow					
37.W	Nugent St.	No Flow					

TABLE I CONT'D

<u>Sample Number</u>	<u>Description of Sampling Points</u>	5-Day BOD <u>(ppm)</u>	SOLIDS Total <u>(ppm)</u>	Susp. <u>(ppm)</u>	Diss. <u>(ppm)</u>	Anionic Detergents as ABS <u>(ppm)</u>	Coliform Count per 100 c.c. <u>M.P.N.</u>
<u>OUTFALLS TO McINTYRE RIVER</u>							
38.W	Maple Ave.	0.7	762	7	755	0.0	15,000
39.W	Memorial Ave.	2.9	404	20	384	0.2	43,000

TABLE II

CITY OF PORT ARTHUR - WATER POLLUTION SURVEYWatercoursesCURRENT RIVER

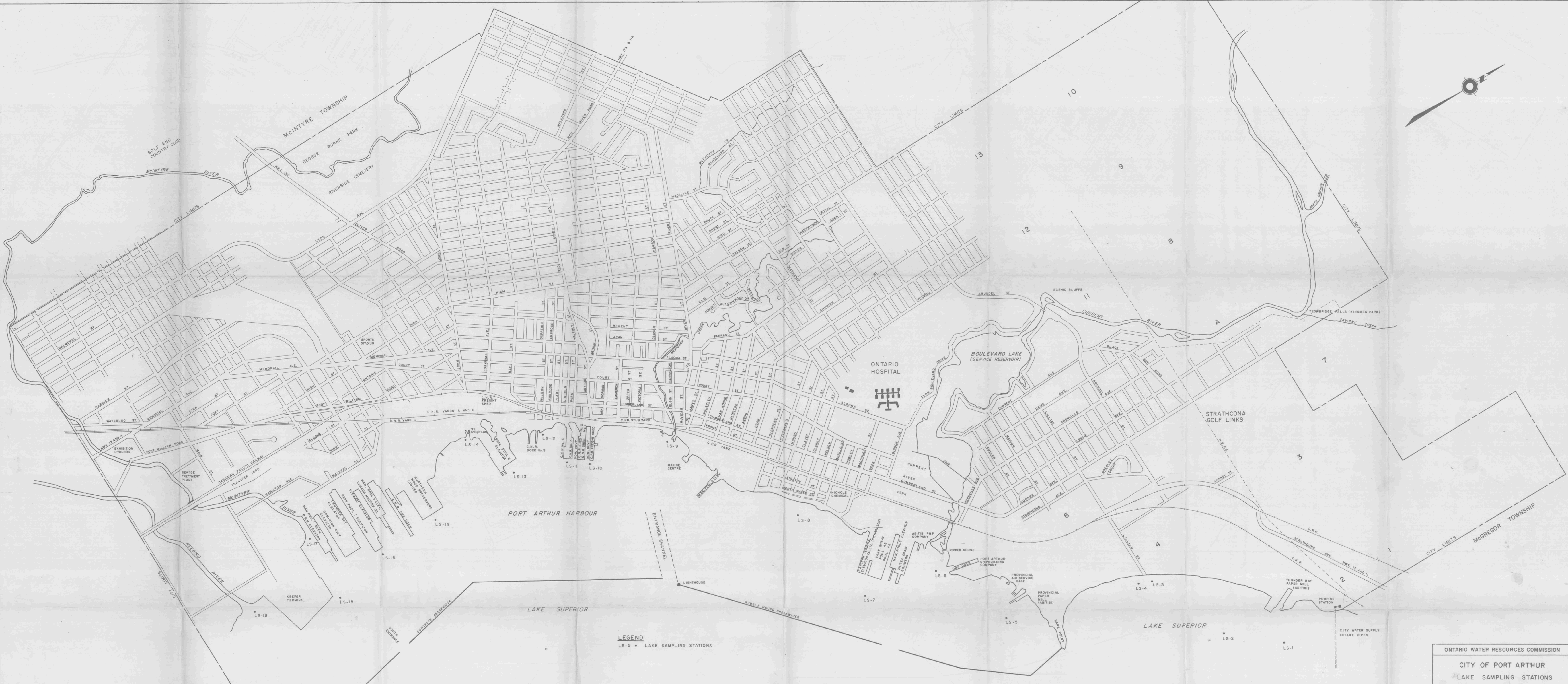
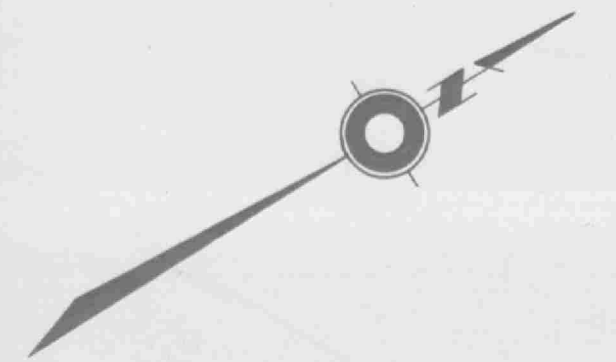
<u>Sample Number</u>	<u>Location of Sampling Point</u>	<u>5-Day BOD (ppm)</u>	<u>Solids Total (ppm)</u>	<u>Turbidity in Silica Units</u>	<u>Anionic Detergents as ABS (ppm)</u>	<u>Coliform Count per 100 c.c. M.P.N.</u>
C-2	at Trowbridge Park	0.7	64	1.4	0.1	1,200
* C-1	at Cumberland St.	0.8	66	3.3	0.1	23

McVICARS CREEK

MV-2	at Hinton St.	0.3	146	1.0	0.2	43
* MV-1	at Cumberland St.	0.5	212	2.7	0.1	2,300

McINTYRE RIVER

M-3	upstream from City of Port Arthur	0.9	124	2.9	0.0	93
M-2	at Fort William Rd.	0.4	134	2.9	0.1	2,300
M-1	at Hamilton Ave. (downstream from WPCP).	11.0	178	11.0	1.6	11,000,000



LEGEND
LS-5 • LAKE SAMPLING STATIONS

ONTARIO WATER RESOURCES COMMISSION	
CITY OF PORT ARTHUR	
LAKE SAMPLING STATIONS	
SCALE: 1"=1000'	
DRAWN BY: R.W.	DATE: JAN. 1965
CHECKED BY:	DRAWING No. 65-6